

Practitioner's Docket No. LAR-16499-1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Jan M. Smits et al.
Application No.: 10/730,188 Group No.: 1792
Filed: December 4, 2003 Examiner: Fletcher III, William P.
Confirmation No.: 2189
For: Controlled Deposition and Alignment of Carbon Nanotubes

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF ELECTRONIC TRANSMISSION

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Response to Examiner – 8 pages to include this certificate of electronic transmission
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9/17/08
Date

Robin W. Edwards
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23351

Application No. 10/730,188
Amendment dated September 17, 2008
Reply to Office Action dated March 17, 2008

AMENDMENT UNDER 37 C.F.R. § 1.116

Sir:

In response to the Office Action of March 17, 2008, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-7 (canceled)

Claim 8 (previously presented): A method for the deposition and alignment of carbon nanotubes, comprising the steps of:

providing an assembly that comprises a substrate having at least two electrodes supported thereon and opposing one another with a gap region being defined therebetween;

depositing a carbon nanotube (CNT) attraction material on said substrate in said gap region;

applying an electric potential to said two opposing electrodes wherein an electric field is generated across said gap region;

wetting said CNT attraction material with a solution defined by a carrier liquid having carbon nanotubes (CNTs) suspended therein, wherein a first portion of said CNTs are aligned with said electric field and adhered to said CNT attraction material, and wherein a second portion of said CNTs are not adhered to said CNT attraction material; and

removing said carrier liquid and said second portion of said CNTs from said assembly; wherein said CNT attraction material is a self-assembled monolayer.

Claim 9 (previously presented): A method for the deposition and alignment of carbon nanotubes, comprising the steps of:

providing an assembly that comprises a substrate having at least two electrodes supported thereon and opposing one another with a gap region being defined therebetween;

depositing a carbon nanotube (CNT) attraction material on said substrate in said gap region;

applying an electric potential to said two opposing electrodes wherein an electric field is generated across said gap region;

wetting said CNT attraction material with a solution defined by a carrier liquid having carbon nanotubes (CNTs) suspended therein, wherein a first portion of said CNTs are aligned with said electric field and adhered to said CNT attraction material, and wherein a second portion of said CNTs are not adhered to said CNT attraction material; and

removing said carrier liquid and said second portion of said CNTs from said assembly; wherein said CNT attraction material forms at least one hydrogen bond with a sidewall of each CNT from said first portion of said CNTs.

Claims 10-18 (canceled)

Claim 19 (previously presented): A method for the deposition and alignment of carbon nanotubes, comprising the steps of:

providing an assembly that comprises a substrate having at least two electrodes supported thereon and opposing one another with a gap region being defined therebetween;

depositing a CNT attraction material on at least portions of each of said two opposing electrodes and on said substrate in said gap region between said portions of each of said two opposing electrodes;

applying an electric potential to said two opposing electrodes wherein an electric field is generated across said gap region;

wetting said CNT attraction material with a solution defined by a carrier liquid having CNTs suspended therein, wherein a first portion of said CNTs are aligned with said electric field and adhered to said CNT attraction material, and wherein a second portion of said CNTs are not adhered to said CNT attraction material; and

removing said carrier liquid and said second portion of said CNTs from said assembly; wherein said CNT attraction material is a self-assembled monolayer.

Claim 20 (previously presented): A method for the deposition and alignment of carbon nanotubes, comprising the steps of:

providing an assembly that comprises a substrate having at least two electrodes supported thereon and opposing one another with a gap region being defined therebetween;

depositing a CNT attraction material on at least portions of each of said two opposing electrodes and on said substrate in said gap region between said portions of each of said two opposing electrodes;

applying an electric potential to said two opposing electrodes wherein an electric field is generated across said gap region;

wetting said CNT attraction material with a solution defined by a carrier liquid having CNTs suspended therein, wherein a first portion of said CNTs are aligned with said electric field and adhered to said CNT attraction material, and wherein a second portion of said CNTs are not adhered to said CNT attraction material; and

removing said carrier liquid and said second portion of said CNTs from said assembly; wherein said CNT attraction material forms at least one hydrogen bond with a sidewall of each CNT from said first portion of said CNTs.

Claims 21-31 (canceled)

REMARKS

The Office Action dated March 17, 2008, has been reviewed in detail and the claims have been amended in the sincere effort to place the same in condition for allowance.

Claims 1-31 are pending in the present application. Claims 8, 9, 19, and 20 are allowed. Claims 1-7, 10-18 and 21-31 are rejected. Claims 1-7, 10-18 and 21-31 are canceled herein.

Applicants retain the right to pursue broader claims via a continuing application under 35 U.S.C. § 120.

Response to Arguments

The Examiner provided:

Applicant's arguments filed December 7, 2007, have been fully considered but they are not persuasive.

*The Examiner notes that Applicant provides no explicit definition of the precise nature and extent of the attraction exhibited by the claimed "attraction material." Further, the Examiner notes that the claims do not require that the attraction material "attracts CNTs out of solution at specific locations on the device substrate." Rather, the claims merely require deposition of an attraction material, wetting of the attraction material with CNT-containing solution, and adhesion of the CNTs to the attraction material. Bower teaches a material that, at some point after contact with a CNT-containing solution, anchors or retains CNTs. It is the Examiner's position that such an anchoring or retaining is a form of attraction not expressly excluded from the claim by either the language of the claim or the definition of the claim terminology presented in the specification. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).*

Applicant's assertions in Item 2, starting at page 13 of the remarks, are mere conjecture and are unsupported by any evidence of record.

Claim Rejections - 35 USC § 103

The Examiner provided:

*Claims 1-7, 10-18, and 21-31, are rejected under 35 U.S.C. 103(a) as being unpatentable under *Chen et al.* in view of *Bower et al.**

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These claims remain rejected as set forth under this heading in the prior Office action and as explained above.

Allowable Subject Matter

The Examiner provided:

Claims 8, 9, 19, and 20, are allowed.

Claims 1-7, 10-18 and 21-31 are canceled herein.

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CONCLUSION

In view of the above Amendments and Remarks, the Applicants submit that all pending claims (8, 9, 19 and 20) in the instant application are in condition for allowance (as previously indicated as allowable subject matter by the Examiner in the March 17, 2008 office action). The Applicants respectfully request an early action to this end.

Respectfully submitted,

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